

EXHIBIT #4

Introduction

Networks are currently one of the fastest growing and most important developments in the computer industry. Not only are more and more PCs becoming parts of networks, but networked PCs are being incorporated into larger enterprise-wide applications so that everyone in a company can access and share data.

With the expanding technology of networking comes the terminology to describe it. This *Dictionary of Networking* provides definitions for all the terms you will encounter when dealing with networks of any type.

Who Should Use This Book?

This book is designed to meet the needs of people who work with networks, communications, and mobile computing systems. Whether you are networking previously unconnected computers or downsizing from a mainframe, this book is for you. And if you are studying for one of the network certification exams, you will find this book to be an essential reference.

Network users of all levels are barraged with an almost bewildering array of terms, abbreviations, and acronyms in books, magazine and newspaper articles, advertisements, and their day-to-day conversations. Jargon is a useful shorthand, but it can easily become incomprehensible and unmanageable, even to the most seasoned network administrator.

What You'll Find in This Book

Along with clear explanations of the jargon and slang associated with networking, you'll find definitions of more than 3,000 networking technical terms, abbreviations, and acronyms. The list that follows gives you a brief overview of the topics that this book covers:

- Acronyms and abbreviations
- Active Directory
- ActiveX
- Application software
- Cables, cards, and connectors
- Certification schemes
- Chips, memory, and adapters
- Communications

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- Connectivity tools, products, and equipment
- Disks and storage media
- E-mail
- Hardware
- File systems
- Industry standards
- Internet organizations
- Internet terms and abbreviations
- Intranet terms and abbreviations
- Java
- Leading hardware and software companies
- Linux, Free Software Foundation, GNU
- Microprocessors
- Microsoft Windows
- Microsoft Windows NT and NT Server
- Microsoft Windows 2000
- Mobile computing
- Networking theory and concepts
- Novell NetWare
- Novell Directory Services
- Operating systems and environments
- The OSI Reference Model
- Popular networking products
- Protocols and interfaces
- Security and network administration
- System architectures
- Trade associations

- Unix shells, tools, and utilities
- The World Wide Web
- Workstations

How This Book Is Organized

This book is organized for easy reference. Entries are arranged in letter-by-letter alphabetic order, ignoring punctuation and spaces, with terms that begin with an uppercase letter (or are all in uppercase) before those in all lowercase letters. So *Internet* comes before *internet*, and *link level* comes before *link-state routing algorithm*. Numbers and symbols are listed at the beginning of the book in ascending numeric order. If an entry begins with a letter or letters, but contains a number, it is listed alphabetically according to the letter, and then according to numerical order, so *V.42 bis* comes between *V.42* and *V.54*.

The information within each entry is always presented in the following order:

- Entry name
- Abbreviation or acronym
- Pronunciation, if it isn't obvious
- Definition, written in clear standard English
- URL pointing to further resources available on the Internet.
- Cross-references to other entries that provide additional or related information on the topic; more on the cross references in a moment.

If an entry has multiple definitions, each one is numbered to separate it from the next, and some of the entries also contain illustrations.

Extensive Cross-Referencing

The *Dictionary of Networking* is the most extensively cross-referenced dictionary of computing and networking terms available today. It contains two kinds of cross references:

- A *See* reference points to another entry that contains the information you are looking for. Thus, you can start with an abbreviation, such as *PPTP*, or with the complete term, such as *Point-to-Point Tunneling Protocol*, and be sure that you will arrive at the correct definition. You don't have to know what an abbreviation stands for to be able to look up a term. Some terms or concepts can be referred to by more than one name, such as *dialback modem* and *callback modem*; you will find both here, so you can always find your way to the appropriate definition.

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- A *See also* reference points to one or more entries that contain additional information about a topic. This kind of cross-reference allows you to follow through a related set of entries, broadening your search as you move from entry to entry.

We have also added an extra element in this dictionary to help you find information, and that is the pronunciation of an acronym or abbreviation that is pronounced differently from the way it is spelled. For example, if you are reading a magazine article and come across the abbreviation *SCSI*, you can look up the abbreviation, which will point to the main entry term, *Small Computer System Interface*. But if you are discussing hard disk interfaces with a colleague and hear the term *scuzzy*, you can look that up too, and you will also find your way to the main entry, *Small Computer System Interface*.

The Appendices

This book contains four appendices to provide additional reference material:

Appendix A: Internet Resources Collects together URLs under a wide variety of headings to cut down on the amount of time you have to spend with your favorite search engine. Using this appendix, you can go straight to the right Web site every time.

Appendix B: Certification Resources Provides a guide through the complex and confusing world of computer and networking certification programs.

Appendix C: ASCII Charts Contains both the standard and the extended American Standard Code for Information Interchange charts.

Appendix D: EBCDIC Chart Contains the most widely accepted Extended Binary Coded Decimal Interchange Code chart.

A Note about the URLs in This Book

Nothing is more annoying than a dead URL, and link rot is all pervasive. (If you don't know what link rot is, go look it up.) All the URLs in this book have been individually checked by our Technical Editor; and at the time of writing, they are all active, they all work, and they all contain the information that I say they contain. But that is not to say that some of them won't have changed by the time you try them out.

The better-organized sites will simply post a link to the new site if they make substantive changes, and you can use that new link to go right to the new or reorganized site. Other sites, such as the Microsoft Web site, reorganize themselves periodically as a part of their housekeeping; the information you want is still available, but you have to look in another place to find it, or use the site's built-in search engine to find it.

Some of the sites that contain the most advanced technical information belong to the .edu domain and are usually computer science departments at the major universities. I have tried to keep the number of such sites to a minimum in this book. Although they can be extremely useful, they usually have a lifespan that closely resembles that of the average graduate student. Once the student maintaining the information graduates, the site becomes neglected and is usually removed soon after. Another dead URL.

To be consistent with current usage, I have not specified the protocol used to access each Web site; unless a different protocol is specified, you can simply assume that HTTP will work in all cases. Just add `http://` to the beginning of each Web address in your browser when you access a site.

And finally, we have tried very carefully not to break a URL across a line; you should be able to type the characters you see without having to worry about whether to type that hyphen. If a URL has to break, the break is before a period (.) or after a slash (/).

About the Companion CD

The companion CD contains an electronic version of this entire book. You can use it to find entries quickly and follow cross-references without a great deal of page flipping.

And Finally...

Through more than 25 years of hands-on involvement in practical computer applications, including the management of minicomputer systems, PC-based networks, large-scale data communications systems, software development, and technical support, I have become intimately familiar with computer and networking terminology. The *Dictionary of Networking* is a direct result of that experience, and it represents a practical and down-to-earth approach to computers and computing.

Everyone who has worked on this dictionary has tried to make sure that it is as complete and accurate as possible. But if you think that we have missed a word or two that should be included in a future edition, or if you think that an entry doesn't contain enough information, please write to the following address:

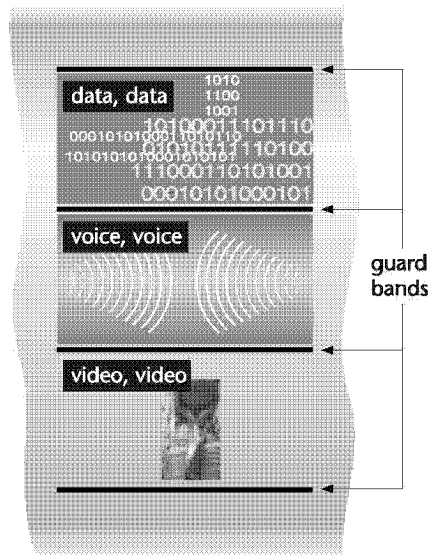
Dictionary of Networking
c/o SYBEX Inc.
1151 Marina Village Parkway
Alameda, CA 94501-1044
USA

The transmission capacity is divided into several distinct channels that can be used concurrently by different networks, normally by frequency-division multiplexing (FDM). The individual channels are pro-

tected from each other by guard channels of unused frequencies. A broadband network can operate at speeds of up to 20Mbps.

See also baseband network; multiplexer.

BROADBAND NETWORK



broadcast To send a message to all users currently logged in to the network.

See also multicast.

broadcast storm Congestion on a network that occurs when a large number of frames are transmitted by many workstations in response to a transmission from one workstation.

broker A Novell Distributed Print Services (NDPS) service providing management services for network printers, including event notification and storage of printer resources such as device drivers.

brouter A networking device that combines the attributes of a bridge and a router. A brouter can route one or more specific protocols, such as TCP/IP, and bridge all

U

UART *See* universal asynchronous receiver/transmitter.

UBR *See* Unspecified Bit Rate.

UDP *See* User Datagram Protocol.

Ultra SCSI An extension of the SCSI-2 standard that increases the data-transfer rate to 20Mbps independent of the bus width. Ultra SCSI supports four to eight devices depending on cable type and length.

See also SCSI-2; Small Computer System Interface.

Ultra2 SCSI An extension of the SCSI-2 standard that increases the data transfer rate to 40Mbps over an 8-bit bus. Ultra2 SCSI supports a maximum of 8 devices.

See also SCSI-2; Small Computer System Interface.

Ultra Wide SCSI An extension of the SCSI-2 standard that increases the data-transfer rate to 80Mbps over a 16-bit bus. Ultra2 SCSI supports a maximum of 16 devices.

See also SCSI-2; Small Computer System Interface.

Ultrix A version of Unix from Digital Equipment Corporation that looks and works like BSD Unix.

See also BSD Unix.

UMB *See* upper memory block.

unauthorized access To gain entry to a computer system using a stolen or guessed password.

See also hacker; intruder.

unbundled software 1. Software sold with a computer system that is priced separately, rather than included as part of a package.

2. A feature in an application repackaged and sold by itself at a lower price.

See also bundled software.

UNC *See* Universal Naming Convention.

uncompress The process of restoring a compressed file to its original form.

See also unzip.

undelete To recover an accidentally deleted file. Many operating systems include commands you can use to recover a deleted file; however, once the file has been overwritten on your hard disk by a new file, the original is lost, and the only way to get it back is to reload it from a recent backup.

See also file recovery.

unicast The broadcast of individual audio or video signals from a server to individual clients to provide an on-demand video service.

See also IP multicast; multicast.